Welcome to NSTA’s Daily Do

Teachers and families across the country are facing a new reality of providing opportunities for students to do science through distance and home learning. The Daily Do is one of the ways NSTA is supporting teachers and families with this endeavor. Each weekday, NSTA will share a sensemaking task teachers and families can use to engage their students in authentic, relevant science learning. We encourage families to make time for family science learning (science is a social process!) and are dedicated to helping students and their families find balance between learning science and the day-to-day responsibilities they have to stay healthy and safe.

What is Sensemaking?

Sensemaking is actively trying to figure out how the world works (science) or how to design solutions to problems (engineering). Students do science and engineering through the science and engineering practices. Engaging in these practices necessitates students be part of a learning community to be able to share ideas, evaluate competing ideas, give and receive critique, and reach consensus. Whether this community of learners is made up of classmates or family members, students and adults build and refine science and engineering knowledge together.
**Introduction**

A sweaty drinking glass, dew-covered grass, and water drops on a bathroom mirror - you may shout out, "Condensation!" to explain these phenomena, but did you ever stop to wonder where the water comes from?

In today's Daily Do, *Where does the water come from?*, students engage in science and engineering practices and use the thinking tool of patterns (crosscutting concept) to begin to make sense of science ideas about the role of condensation in the cycling of water between the atmosphere and land.

*This task uses common household materials and can be easily adapted for distance science learning.*

**Experience the Phenomenon**

Say to students, "I have a puzzling phenomenon to share with you." Ask students to open their science notebooks create three columns labeled Time 0, Time 1 and Time 2. You might ask them to turn their notebook sideways (or their electronic document to landscape) to create wider columns.

Tell students you are going play the entire [Condensation video](https://www.youtube.com/watch?v=example), but you will stop in three place to allow them time to make and record observations. Encourage students to make observations while the video is playing (between Times 0, 1 and 2) as well.

Play the video and stop at 0:08. Ask students to independently make and record observations. Suggest that students use words, pictures, and/or symbols. Tell them to also record any questions they have; they might circle or highlight the questions to make them stand out from their observations or record them on a separate page.

Continue playing the video, stopping at 0:20 and 0:32, each time allowing students to make and record observations and note questions that arise. Then, play the video one more time without stopping and allow students to add to and/or revise their observations.

Ask students to share their observations with a partner or small group. As you listen to the group conversations, redirect students who are moving from observations to explanation:

- Is that something you think you know, or something you observed?
- Right now, we're interested in the what not the why.
- When you say 'there's condensation on the glass' what do you mean?

Next, ask students, "Where could the water drops on the outside of the glass come from? Why do you think so?" Ask students to first independently think about and record their ideas in their science notebook. Then ask students to turn to a partner and share their ideas. Some students will likely say the water come from inside the cup and others will say it came from outside the cup. Ask students to share observations from the video that support their idea.

Some students may say water from the air condensed on the glass. This is OK. Respond by saying, "OK, you also think the water came from outside the glass. I wonder how we might support that
claim with evidence." Then to the class say, "How might we investigate whether the water drops on the outside of the glass came from inside the cup or outside the cup? What data would we collect and why?"

**Plan and Conduct an Investigation(s)**

Ask students to brainstorm investigation ideas in small groups. Then ask groups to choose one idea to share with the class. Students might share the following ideas: *(Teacher follow-up questions are provided, but you might give student groups an opportunity to ask each other follow-up questions.)*

- Put a lid on the cup and see if water drops form on the outside of the cup. *How could we be sure water molecules/particles are not going through the cup?* Mark the water level at the start; the water level dropping would tell you water is going through the cup. Wrap the glass tightly in plastic/tape so the water can’t leak out; if water drops form on the outside they came from outside the cup. Put food coloring in the water; if the water drops on the outside are the same color as the water on the inside, the water drops are coming from inside the cup.

- Block air from touching the cup. *How might we block air from touching the cup?* Put the cup in a baggie with the air sucked out. *What would you expect to happen if the water drops were coming from inside the cup? Outside the cup?* Water drops would form on the outside of the cup if water was coming from inside the cup, but there wouldn’t be water drops if water was coming from outside the cup.

- Weigh the cup and see if it gets heavier when the water drops form. *What would you expect to happen to the mass if the water drops were coming from inside the cup? Outside the cup?* Mass will stay the same if water drops are coming from inside the cup.

*Note: If you don’t have a mass balance that measures to the nearest 0.1 g available, students will not be able to conduct the third suggested investigation.*

You might decide as a class to conduct a series of investigations to answer the question, "Where do the water drops on the outside of the glass come from, inside the cup or outside the cup?" You might also consider allowing each group to collaboratively plan and conduct one of the above suggested investigations and share their data with the class.

*This task continues with student groups planning and conducting their own investigations.*

Assign students to small groups (or allow them to self-assign) based on which investigation they want to conduct. Ask student groups to be prepared to share with another group:

1. the investigation plan (this does not need to be a step by step procedure)
2. the data they will collect and how they will collect it
3. why they are collecting these data

Give groups the opportunity to share their investigation plan with another group. You might match groups with different types of investigations to keep group bias for their own design from influencing their critique of another group’s design. To facilitate the discussion between groups, you might have each group identify one thing they like (and why) about the other group’s plan and one question about the plan. This question might be about the plan design, the type of data the
As groups are sharing their ideas, you may also want to pose questions as a way of providing feedback to the groups. Confirm that all students plan to use cold water. Suggest to groups planning to measure water level in the cup over time to use cold water without ice.

Allow groups time to revise their investigation plans based on feedback from their partner group. You might ask groups to share feedback with the class that was particularly helpful in improving their investigation plan. Then ask student groups to conduct their investigations.

You might use a digital tool like Flipgrid for groups to share a recap of their investigation and their results (each group member can contribute to the same Flipgrid). Alternatively, groups can upload artifacts of their investigation including data tables, images, and/or video depending on the digital tool used to share group results with the class (Padlet, Jamboard, and Google Slides are a few examples of other digital tools you might use).

Give students independent thinking time (Alone Zone) to observe groups' data. You might ask, "What patterns do you notice within the different data sets? What patterns do you notice between the different group data sets?" Then, ask students to return to their groups to share patterns they identified.

**Build Understanding**

Bring students back together. You might begin by asking, "Could someone restate the question we are trying to answer?"

You might then ask the following questions to collectively answer the question, "Where do the water droplets on the outside of the glass come from, inside the cup or outside the cup?"

- What are some of your claims? What is your evidence?
- Does it always work this way?
- Does any group have evidence to support Group A's claim?
- What data do we have that challenges Group B's claim?
- What can we conclude?

Students will likely conclude the water drop on the outside of the glass came from **outside** the cup.

Ask students, "What might we figure out next?"

**NSTA Collection of Resources for Today's Daily Do**

NSTA has created a [Where did the water come from?](#) collection of resources to support teachers and families using this task. If you're an NSTA member, you can add this collection to your library by clicking **Add to library** (near top of page).